

ABSTRACT OF THE DISCLOSURE

The invention includes modified dihydroflavonol 4-reductase (DFR) nucleic acids encoding the modified DFR that has altered amino acid sequences at the substrate specificity determining region. The property of the modified DFR is characterized by its ability to reduce dihydrokaempferol (DHK) preferentially over dihydroquercetin (DHQ), and dihydromyricetin (DHM). The invention also includes plants having at least one cell expressing the modified DFR. Such plants are characterized by the increased content of pelargonidin-based pigments. The invention also includes vectors comprising at least a portion of the modified DFR nucleic acids. The invention also includes methods using such vectors for producing plants having the increased content of pelargonidin-based pigments.